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Remarks

The Office Action mailed May 19, 2004, has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-2, 4-11, 13-17, 19-23, and 25-30 are now pending in this application. Claims 3, 12, 18, and 24 have been canceled. Claims 1-30 are rejected. Claims 2, 11, and 17 are newly independent, and a fee calculation is submitted herewith.

The rejection of Claims 1-21 under 35 U.S.C. § 103(a) as being unpatentable over Deming et al. (U.S. Patent No. 4,226,026) in view of Tsumanuma et al. (U.S. Published Appl. No. 20020096511A1) is respectfully traversed.

Deming et al. describes a method of drying clothes having a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle.

Tsumanuma et al. describes a method for controlling temperature for electrical heating equipment by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage.

In addition, Applicants respectfully submit that the Examiner's Section 103 rejection of presently pending Claims 1-21 is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Deming et al. in view of Tsumanuma et al.

More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. The required teaching, suggestion and incentive supporting the Examiner's combination is absent here. Neither Deming et al. nor Tsumanuma et

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al. teach or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicant respectfully submits that it would not be obvious to one skilled in the art to combine Deming et al. and Tsumanuma et al. because there is no motivation to combine these references suggested in the art. The Examiner has not pointed to any prior art that teaches or suggests combining the disclosures.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown. Specifically, the Examiner has not pointed to any prior art that teaches or suggests a reasonable expectation of success or motivation in combining the references.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is apparently based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention.

Since there is no teaching, suggestion, or motivation in the cited references for the claimed combination recited in Claims 1-21, the Section 103 rejection of Claims 1-21 appears to

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be based on impermissible hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and applicants respectfully request the 103 rejection of Claims 1-21 be withdrawn.

Moreover, Applicants respectfully submit that neither Deming et al. nor Tsumanuma et al., alone or in combination, describe or suggest the claimed invention. Claim 1 recites a method of limiting current including providing an AC sine wave to at least one heater element of an electric clothes dryer, stopping the providing at a zero crossing of the AC sine wave, monitoring the AC sine wave for a subsequent zero crossing, and reproviding the AC sine wave to the at least one heater element at the subsequent zero crossing, wherein the reproviding comprises reproviding the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped.

Neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest the method as recited in Claim 1. More specifically, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a method of limiting current including providing an AC sine wave to at least one heater element of an electric clothes dryer, stopping the providing at a zero crossing of the AC sine wave, monitoring the AC sine wave for a subsequent zero crossing, and reproviding the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped. Moreover, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a method including monitoring the AC sine wave for a subsequent zero crossing, and reproviding the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped. Rather, Deming et al. describes a method of drying clothes having a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and Tsumanuma et al. describes a method for controlling temperature for electrical heating

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equipment by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage. Accordingly, Applicants respectfully submit that Claim 1 is patentable over Deming et al. in view of Tsumanuma et al.

Claim 3 has been canceled. Claims 4-6 depend from Claim 1. When the recitations of Claims 4-6 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 4-6 are also patentable over Deming et al. in view of Tsumanuma et al.

Claim 2 recites a method of limiting current including providing an AC sine wave to at least one heater element of an electric clothes dryer, stopping the providing at a zero crossing of the AC sine wave, monitoring the AC sine wave for a subsequent zero crossing, and reproviding the AC sine wave to the at least one heater element at the subsequent zero crossing, wherein the reproviding comprises reproviding the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped.

Neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest the method as recited in Claim 2. More specifically, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a method of limiting current including providing an AC sine wave to at least one heater element of an electric clothes dryer, stopping the providing at a zero crossing of the AC sine wave, monitoring the AC sine wave for a subsequent zero crossing, and reproviding the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped. Moreover, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a method including reproviding the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped. Rather, Deming et al. describes a method of drying clothes having a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and Tsumanuma et al. describes a method for controlling temperature for electrical heating

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equipment by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage. Accordingly, Applicants respectfully submit that Claim 2 is patentable over Deming et al. in view of Tsumanuma et al.

Claims 7-9 depend from Claim 2. When the recitations of Claims 7-9 are considered in combination with the recitations of Claim 2, Applicants submit that dependent Claims 7-9 are also patentable over Deming et al. in view of Tsumanuma et al.

Claim 10 recites an electric clothes dryer heater system including a heater element and a controller operationally coupled to the heater. The controller is configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at the subsequent zero crossing, wherein to reprovide the AC sine wave to the at least one heater element, the controller configured to reprovide at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped.

Neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest the system as recited in Claim 10. More specifically, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest an electric clothes dryer heater system including a controller operationally coupled to the heater, and configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped. Moreover, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest an electric clothes dryer heater system including a controller configured to provide reprovide the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was

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stopped. Rather, Deming et al. describes a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and Tsumanuma et al. describes electrical heating equipment controlling temperature by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage. Accordingly, Applicants respectfully submit that Claim 10 is patentable over Deming et al. in view of Tsumanuma et al.

Claim 12 has been canceled. Claims 13-15 depend from Claim 10. When the recitations of Claims 13-15 are considered in combination with the recitations of Claim 10, Applicants submit that dependent Claims 13-15 are also patentable over Deming et al. in view of Tsumanuma et al.

Claim 11 recites an electric clothes dryer heater system including a heater element and a controller operationally coupled to the heater. The controller is configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at the subsequent zero crossing, wherein to reprovide the AC sine wave to the at least one heater element, the controller configured to reprovide at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped.

Neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest the system as recited in Claim 11. More specifically, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest an electric clothes dryer heater system including a controller operationally coupled to the heater, and configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped.

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Moreover, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest an electric clothes dryer heater system including a controller configured to reprovide the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped. Rather, Deming et al. describes a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and Tsumanuma et al. describes electrical heating equipment controlling temperature by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage. Accordingly, Applicants respectfully submit that Claim 11 is patentable over Deming et al. in view of Tsumanuma et al.

Claim 16 recites a dryer for tumble drying articles including a drum including a cavity configured to hold articles to be dried, a motor drivingly coupled to the drum to rotate the drum, a heater element in flow communication with the cavity, a blower positioned to deliver heated air to the cavity, and a controller operationally coupled to the heater. The controller is configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at the subsequent zero crossing, wherein to reprovide the AC sine wave to the at least one heater element, the controller configured to reprovide at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped.

Neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest the apparatus as recited in Claim 16. More specifically, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a dryer including a controller configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the

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AC sine wave was stopped. Moreover, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a dryer including a controller configured to reprovide the AC sine wave to the at least one heater element at a zero crossing more than two half cycles subsequent the zero crossing at which the AC sine wave was stopped. Rather, Deming et al. describes a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and Tsumanuma et al. describes electrical heating equipment controlling temperature by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage. Accordingly, Applicants respectfully submit that Claim 16 is patentable over Deming et al. in view of Tsumanuma et al.

Claim 18 has been canceled. Claims 19-21 depend from Claim 16. When the recitations of Claims 19-21 are considered in combination with the recitations of Claim 16, Applicants submit that dependent Claims 19-21 are also patentable over Deming et al. in view of Tsumanuma et al.

Claim 17 recites a dryer for tumble drying articles including a drum including a cavity configured to hold articles to be dried, a motor drivingly coupled to the drum to rotate the drum, a heater element in flow communication with the cavity, a blower positioned to deliver heated air to the cavity, and a controller operationally coupled to the heater. The controller is configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at the subsequent zero crossing, wherein to reprovide the AC sine wave to the at least one heater element, the controller configured to reprovide at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped.

Neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest the apparatus as recited in Claim 17. More specifically, neither Deming et al.

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nor Tsumanuma et al., considered alone or in combination, describe or suggest a dryer including a controller configured to provide an AC sine wave to at least one heater element of an electric clothes dryer, stop the providing at a zero crossing of the AC sine wave, monitor the AC sine wave for a subsequent zero crossing, and reprovide the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped. Moreover, neither Deming et al. nor Tsumanuma et al., considered alone or in combination, describe or suggest a dryer including a controller configured to reprovide the AC sine wave to the at least one heater element at a zero crossing immediately subsequent the zero crossing at which the AC sine wave was stopped. Rather, Deming et al. describes a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and Tsumanuma et al. describes electrical heating equipment controlling temperature by reducing one cycle of an AC waveform from a unit cycle group including a plurality of cycles of waveform of the input AC voltage. Accordingly, Applicants respectfully submit that Claim 17 is patentable over Deming et al. in view of Tsumanuma et al.

For the reasons set forth above, Applicants respectfully request that the rejection of Claims 1-21 be withdrawn.

The rejection of Claims 22-30 under 35 U.S.C. § 103(a) as being unpatentable over Deming et al. (U.S. Patent No. 4,226,026) in view of JP319 (Japan Published Appl. No. JP402118319A) is respectfully traversed.

Deming et al. describes an apparatus for drying clothes having a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle.

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JP319 describes a control system custom gas heater for controlling cooling and heating by raising the fire power of a custom heater to a set value by performing A/D conversion on the feedback current of a linear gas valve at a high speed to the control system.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Deming et al. according to the teachings of JP319. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention absent some teaching, suggestion, or incentive supporting the combination. Neither Deming et al. nor JP319, considered alone or in combination, describe or suggest the claimed combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from multiple patents in an attempt to reconstruct the structures recited in the presently pending claims.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

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Moreover, the Federal Circuit has determined that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); Schenck v. Nortron Corp., 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983). A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case, Deming et al. describes using two solenoid actuated valves to control gas to a heater. Using two solenoid actuated valves in JP319 necessarily alters the system design of using A/D conversion and a linear valve to control gas to a heater. Therefore, Applicants respectfully submit that Deming et al. and JP319 teach away from each other.

Moreover, Applicants respectfully submit that neither Deming et al. nor JP319, alone or in combination, describe or suggest the claimed invention. Claim 22 recites a gas clothes dryer heater system including a linear gas valve, a burner operationally coupled to the valve, and a controller operationally coupled to the valve, wherein the controller is configured to control the valve in an on state such that the burner produces a first heat output, and adjust the valve in the

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on state such that the burner produces a second heat output less than the first based on an input signal from a temperature sensor.

Neither Deming et al. nor JP319, considered alone or in combination, describe or suggest the system as recited in Claim 22. More specifically, neither Deming et al. nor JP319, considered alone or in combination, describe or suggest a gas clothes dryer heater system including a linear gas valve, a burner operationally coupled to the valve, and a controller operationally coupled to the valve, wherein the controller is configured to control the valve in an on state such that the burner produces a first heat output, and adjust the valve in the on state such that the burner produces a second heat output less than the first based on an input signal from a temperature sensor. Moreover, neither Deming et al. nor JP319, considered alone or in combination, describe or suggest a gas clothes dryer heater system including a controller configured to control the valve in an on state such that the burner produces a first heat output, and adjust the valve in the on state such that the burner produces a second heat output less than the first based on an input signal from a temperature sensor. Rather, Deming et al. describes a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and JP319 describes a control system custom gas heater for controlling cooling and heating by raising the fire power of a custom heater to a set value by performing A/D conversion on the feedback current of a linear gas valve at a high speed to the control system. Accordingly, Applicants respectfully submit that Claim 22 is patentable over Deming et al. in view of JP319.

Claim 24 has been canceled. Claims 23 and 25-26 depend from Claim 22. When the recitations of Claims 23 and 25-26 are considered in combination with the recitations of Claim 22, Applicants submit that dependent Claims 23 and 25-26 are also patentable over Deming et al. in view of JP319.

Claim 27 recites a dryer for tumble drying articles including a drum comprising a cavity configured to hold articles to be dried, a motor drivingly coupled to the drum to rotate the drum,

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a linear gas valve, a burner operationally coupled to the valve and in flow communication with the cavity, a blower positioned to deliver heated air to the cavity, and a controller operationally coupled to the linear gas valve, wherein the controller is configured to control the valve in an on state such that the burner produces a first heat output, and adjust the valve in the on state such that the burner produces a second heat output less than the first.

Neither Deming et al. nor JP319, considered alone or in combination, describe or suggest the apparatus as recited in Claim 27. More specifically, neither Deming et al. nor JP319, considered alone or in combination, describe or suggest a dryer for tumble drying articles including a drum comprising a cavity configured to hold articles to be dried, a motor drivingly coupled to the drum to rotate the drum, a linear gas valve, a burner operationally coupled to the valve and in flow communication with the cavity, a blower positioned to deliver heated air to the cavity, and a controller operationally coupled to the linear gas valve, wherein the controller is configured to control the valve in an on state such that the burner produces a first heat output, and adjust the valve in the on state such that the burner produces a second heat output less than the first. Moreover, neither Deming et al. nor JP319, considered alone or in combination, describe or suggest a dryer for tumble drying articles including a controller configured to control the valve in an on state such that the burner produces a first heat output, and adjust the valve in the on state such that the burner produces a second heat output less than the first. Rather, Deming et al. describes a clothes dryer operating at a low level of energy input for a major portion of a drying cycle, followed by a high energy input for a short period near the end of the drying cycle, and JP319 describes a control system custom gas heater for controlling cooling and heating by raising the fire power of a custom heater to a set value by performing A/D conversion on the feedback current of a linear gas valve at a high speed to the control system. Accordingly, Applicants respectfully submit that Claim 27 is patentable over Deming et al. in view of JP319.

Claims 28-30 depend from Claim 27. When the recitations of Claims 28-30 are considered in combination with the recitations of Claim 27, Applicants submit that dependent Claims 28-30 are also patentable over Deming et al. in view of JP319.

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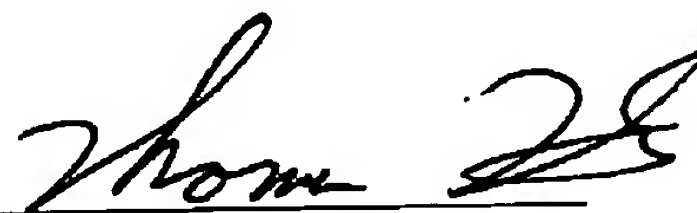
For the reasons set forth above, Applicants respectfully request that the rejection of Claims 22-30 be withdrawn.

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In view of the foregoing remarks, this application is believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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